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Program Manager
For Ammunition
Mr. Jerry L. Mazza
Managing Editor
Mr. Steve Crittenden



Ammunition Quarterly

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Provide ideas/articles to the Program Manager for Ammunition, MARCORSYSCOM, 2200 Lester Street, Quantico, VA 22134-5010, or contact the Managing Editor at scrittenden@caci.com.

From the Program Manager



Mr. Jerry Mazza
Program Manager for Ammunition

During this past April, you, the Ammunition professionals of the Corps—the current and future leadership, the driving force in Supply Class V(W)—participated in the 2005 Ground Ammunition Community Conference, jointly sponsored and hosted by the Training and Education Command/Marine Corps Systems Command, Quantico, Virginia. I would like to thank you for your participation, and thank your organizations for supporting this important event at a time of great tempo for the Marine Corps. A special thanks to General Nyland, the Assistant Commandant, for taking time from his overwhelming schedule to provide our conference with a notable kickoff

speech in which the importance, and tone, of our conference agenda was set. The conference provided a forum for information sharing, cross-organizational discussions, educational briefings, and working groups designed to address key issues facing our community. Information on this conference can be found on the PM Ammunition Website, via the Ground Ammunition Knowledge Management Portal (KMP).

Speaking of the KMP....while I generally provide a variety of discussion points with each AQ, I would like to focus on **OUR** KMP. We have heard many buzz-words these past years such as information-dominance and information-fusion. Several years ago, I directed my Systems Team to embark on a task to stand up a capability for the Marine Corps Ammunition Community, and other stake holders, related to Ammunition and Explosives information. Today, while not complete, we are proud to host the KMP for you, the Marine Corps operating forces and supporting establishment. The primary intent was to capture the tremendous amount of information we utilize in one, web-accessible repository allowing for a more efficient data exchange, and a more knowledgeable occupational field. Within the KMP, you will find a wealth of information which includes: technical data on virtually every ammunition item in our

Marine Corps stockpile, the current MCCDC-published Total Munitions Requirement (TMR), malfunction histories, inventory data by condition code and location, surveillance reports, an assortment of applicable publications, and a variety of HQMC, DoN, and OSD policy guidance, safety data, inspection criteria, and our Field Returns CD designed to assist with inspecting ammunition turn-ins.

We will continue to mature the KMP, make it more user friendly, enhance search capabilities, and provide to the community the information required to better perform your mission. I encourage you, and ask that you do the same within your respective organizations, to use the tools provided. In doing so, we all will speak the collaborative language, raise our collective knowledge base and, in essence, the USMC ammunition community will be on a common footing with regards to information. Semper Fi,

PM-Ammo Conducts First Worldwide Conference Since 1999

Mr. Steven M. Crittenden, LtCol, USMC (Ret)

On 5-8 April the Program Manager for Ammunition (PM-Ammo) hosted its first worldwide ground conventional ammunition conference since 1999. The 2001 Fall conference was cancelled following the terrorist attack on our Nation. Since that time PM-Ammo has been "leaning forward" in its steadfast support of the Corps' Global War on Terrorism (GWOT). Over 100 Marines, civilian employees, and contractors from all over the Corps supporting PM-Ammo attended the conference held at Quantico. The ground ammo community was honored with the presence of the Assistant Commandant of the Marine Corps (ACMC), Gen William L. "Spider" Nyland, who kicked off the conference as the keynote speaker. To view a video of Gen Nyland's speech, the reader may go to PM-Ammo's web site, click on "KMP" (restricted access), and click on "ACMC speech at PM-Ammo Conference."

"Guns up!" For those of you who have served with the infantry, this is a common expression echoed by the infantry unit leader in offensive training, as well as in combat. Simply translated, it means the unit is about to be, or is, in contact with the enemy, and the unit leader directs that his machinegun teams move forward on the battlefield to be prepared to immediately engage that enemy. In many respects, the 2005 Annual PM-Ammo Conference resulted from a similar command from the PM for Ammunition, Mr. Jerry Mazza—"Let's engage the issues as a team." And for 3 ½ days that is exactly what the ground ammunition community accomplished.

The conference, sponsored by both PM-Ammo and the Training and Education Command, began with a laudatory speech by the ACMC that gave praise to the GWOT support provided by the ground ammunition community. The ACMC also challenged the ground ammunition community to be as thorough and accurate as possible when establishing ammunition requirements. In addition, he emphasized the importance of ammunition personnel being more versatile in today's environment, stating that they must also be planners, logisticians, and budgeters.

The first day of the conference continued with presentations from various members of the ground ammunition community. First up was Marine Forces Pacific (MARFORPAC), represented by MGySgt Denman, who addressed the following MARFORPAC topics:

- Cross Servicing
- Common item support
- Coalition support
- Accounting for Service Level Payback
- Processes and procedures

The "take-away" from MGySgt Denman's presentation on MARFORPAC was that **"Operations involving other Services and nations are becoming the norm—we must be able to understand the principles...[addressed] and expect to work with other Services and nations as a unified coalition."**



Capt Emminger of PM-Ammo addresses an issue

Next, MGySgt Denman addressed Marine Expeditionary Unit (MEU) issues. He covered the Iraq, Afghanistan, and Horn of Africa theaters. Under specific actions, the following items were briefed:

- Coordination within the area of responsibility (AOR)
- Authorization to pull landing force operational reserve materiel (LFORM) assets
- Reconstitution of LFORM assets
- Ammunition shipments (sustainment)
- Contingency ammunition
- Training ammunition
- MUREPs (munitions status report)
- Special allowance requests
- MEU issues
 - ❖ Rate allowance per *Marine Corps Bulletin 8011, Class V (W) Materiel*

- Requirements for Training,
Established Testing and Security*
- ❖ Receive multiple “plus-ups” from parent commands from annual allowance
 - ❖ Trend during chop to theater of requesting extra training plus-ups

In summary, “**The requirements of our Operating Forces both for predeployment and mission are ever changing. This makes it vital that we as the ammunition community ensure that ammunition requirements are validated by competent authority, as well as scrutinized for accuracy. We also must educate our commands as to ammunition procedures and policies. Our next mission is just a news report away.**”

Throughout the morning of the first day, the following presentations were given:

- III Marine Expeditionary Force (MEF) Ammunition Sentencing
- Center Magazine Area, Twentynine Palms
- Ammunition Quarterly
- Knowledge Management Enterprise
- Electronic Ammunition and Explosives Qualification and Certification Tool (^EQual)
- Common Logistics Command and Control System (CLC²S)

Beginning in the afternoon, as was the case on each day except Friday, the conference broke up into four working groups to address the following areas:

1. Update PM-Ammo’s Operation Iraqi Freedom/Operation Enduring Freedom (OIF/OEF) Class V (W) Playbook /OIF/OEF Lessons Learned
2. Review of PM-Ammo’s Proposed Physical Inventory Control Program (PICP)
3. Review of *Marine Corps Bulletin*(MCBul) 8011/New Procedures Instituted for Training Ammunition Management Information System-Redesigned (TAMIS-R)
4. Review of Draft *Marine Corps Order 3000.18, Force Deployment and Execution Manual*



The second day began with briefings by Maj Nash, the Ammunition Requirements and Integration Officer, Expeditionary Force Development Center, Marine Corps Combat Development Command (MCCDC), Quantico. His first subject was the Total Munitions Requirement (TMR) Model. Controlling this model is the Munitions Requirement Process (MRP), a Department of Defense (DoD)-wide process governing responsibilities and actions of the Defense Intelligence Agency, Office of the Secretary of Defense (OSD), the Combatant Commanders (COCOMs), the Joint Staff, the Services, and U.S. Special Operations Command for generating consistent munitions requirements as depicted in *DoD Instruction 3000.4*. The performance goal of the DoD-mandated process is to take a given force structure—as determined by the COCOMs—armed for its assigned military mission and estimate the type and quantity of munitions required to defeat a specified enemy threat in accordance with the National Military Strategy and the COCOM’s plans. The MRP establishes a formalized process that is both logical and defensible. The Commanding General (CG), MCCDC produces the TMR for the Marine Corps annually, and it consists of four requirements:

- Combat Requirement (CR)
- Current Operations/Forward Presence Requirement (CO/FPR)
- Strategic Readiness Reserve Requirement (SRR)
- Training and Testing Requirement (TTR)

Once the Marine Corps determines these four requirements, the TMR is then approved by CG, MCCDC and becomes the justification for the acquisition of munitions. It DOES NOT, however, provide the funding for these munitions. That is done by

the Deputy Commandant for Programs and Resources who, in turn, provides the funding to purchase munitions to PM-Ammo for conventional ground ammunition. The bottom line is that **“The Corps will never receive sufficient funding to purchase enough conventional ground ammunition to meet the requirements of the TMR. The end result is that PM-Ammo must prioritize its acquisition of ammunition.”**

The next topic briefed by Maj Nash was the Universal Needs Statement (UNS). UNS is a method for the Operating Forces and the Supporting Establishment to identify a capability requirement or gap to Headquarters Marine Corps (HQMC). The UNS is routed through a series of organizations and groups at MCCDC until it is either returned to the originator or recommended to be reviewed by the Marine Requirements Oversight Council, or MROC, chaired by the ACMC and consisting of all the lieutenant generals that make up HQMC and the CG, MCCDC. The MROC then makes the final decision on the UNS, to include funding and priority determination. **“The key thing to recognize about an UNS is that it identifies a capability gap or desire, not a material solution.”**

Throughout the second morning, the following presentations were given:

- Fielding Plans for New Weapons Systems, to include:
 - High-Mobility Artillery Rocket System (HIMARS)
 - Lightweight 155mm Howitzer (LW 155)
 - Expeditionary Fire Support System (EFSS)
 - Expeditionary Fighting Vehicle (EFV)
 - Tactical Unmanned Guided Vehicle (TUGV) (called Gladiator)
 - Vehicle-mounted, Tube-launched, Non-lethal Weapons System (called Venom)
- Requirements Generator
- Marine Forces Reserve (MARFORRES)
- Ammunition Company, 4th Force Service Support Group, MARFORRES
- I Marine Expeditionary Force (MEF)

On the third day Capt Leighty, the ammunition representative in the G-4, Training and Education Command (TECOM), Quantico began the presentations with his brief on training allowances. In the past commanders have often operated under the perception that there was an unlimited inventory of ground ammunition available for consumption. Additionally, training ammunition requirements were developed

primarily with historical consumption data where the allowances were computed by local commands rather than tied to forecasted training requirements. This process provided unlimited flexibility to the MARFORs when it came to adjustments to their allowance during execution. The reality, however, is that there is a limited inventory of ammunition to support both training and war reserves. Consequently, when determining training allowances MARFORs must consider many factors, to include: training standards, historical consumption, force structure manning, deployments, and new capabilities. Capt Leighty then reviewed the process for requests for changes to training allowances:

- Ammunition training allowances are published annually in *MCBul 8011*.
- Computed allowances in *MCBul 8011* are taken directly from the TMR, however, these allowances are not always fully funded as depicted earlier in this article under Maj Nash’ briefs.
- Prior to submission, it is recommended that allowance change requests be concurred on by all similarly affected parties (i.e., all three MEFs, both Schools of Infantry, etc.).
- Submissions are held at TECOM and are not submitted to MCCDC until the next Program Objective Memorandum (POM) cycle (no later than 15 October).
- Because the POM cycle is a lengthy process, approved allowance changes cannot be immediately funded, procured, manufactured, and delivered for use. (As an example, a POM08 ammunition allowance change submission may not be supportable and appear in *MCBul 8011* until Fiscal Year 2009 (FY09) or FY10.)

Presently if the Operating Forces identify an immediate requirement for additional training ammunition above their allocation, TECOM will query the rest of the Marine Corps’ user community for that ammunition—ultimately redistributing the required amount to the using unit. **“In the unlikely event that requests cannot be satisfied through redistribution, then a special allowance message request is forwarded to TECOM. If PM-Ammo indicates the change is supportable, the ammunition is added to the unit’s current allowance in the Training Ammunition Management Information System-Redesigned (TAMIS-R).”**

Ms. Joyce Robertson, also from TECOM, provided an orientation on Training and Readiness (T&R) issues. TECOM is currently transitioning from Individual Training Standards (ITSs), used as a yardstick to

evaluate individual Marine occupational training, to a more encompassing Mission Essential Tasks (METs) emphasis. As a result, the ground ammunition community will eventually have available to it an Ammunition T&R Program published as a manual. The tenets of the T&R Program were briefed as follows:

- Building block approach to training, beginning with individual training leading to collective (unit) training, all focused on the established METs.
- Training events are linked to expected combat missions (METs)
- Focus on unit capabilities as well as individual skills
- Organize tasks into executable events
- Requires sustainment (frequency of evaluation) of training
- Provides for evaluation of combat readiness

In May representatives of HQMC, MARFORs, and Redstone Arsenal will meet to hammer out various issues concerning the Ammunition T&R Program manual. METs thus far that have been identified for the ground ammunition community are:

1. **Conduct ammunition supply point (ASP) operations**
2. **Conduct combat service support operations**
3. **Conduct supported unit operations**
4. **Conduct operational/contingency planning operations**
5. **Conduct program management operations**
6. **Conduct explosives safety and environmental operations**

For the remainder of the third morning the following presentations were given:

- Marine Liaisons at Naval Facilities
 - Fleet Activities Sasebo, JA
 - Fleet Activities Yokosuka, JA
 - Naval Weapons Station Fallbrook/Seal Beach, CA
- Environmental and Explosives Safety Team Issues
- Marine Detachment, Redstone Arsenal

On the last day, LtCol Ratliff, Marine Corps Liaison Officer, Joint Munitions Command (JMC), Rock Island Arsenal, briefed the Capabilities-Based Analysis Team (CBAT) process he participated in at U.S.



LtCol Ratliff, Marine Corps Liaison, Joint Munitions Command, Rock Island Arsenal, IL briefs attendees

Transportation Command (USTRANSCOM), Scott Air Force Base, IL. In September 2003 the Secretary of Defense (SECDEF) designated the Commander, USTRANSCOM as the Distribution Process Owner (DPO) for DoD. The SECDEF charged USTRANSCOM, as the DPO, with transforming and improving the overall efficiency and interoperability of distribution related activities “from factory to foxhole.” The DPO initiated the End-to-End Architecture aimed at synchronizing the distribution requirements and capabilities of the Services and supported COCOMs in the planning, acquisition, storage, and delivery of sustainment materiel in both peace and war. From November 2004 to January 2005 members of PM-Ammo, including LtCol Ratliff, represented the Marine Corps as subject matter experts on the CBAT at USTRANSCOM to help the DPO develop a business case analysis identifying the optimal mix of information technology (IT) systems, tools, and procedures to support joint munitions distribution management. The CBAT recommended:

- **Establishing a Deputy DPO or Executive Agent for conventional ammunition**
- **Establishing a theater wholesale depot and developing joint doctrine to support it**
- **Establishing joint procedures for the strategic distribution of munitions in support of contingency operations**
- **Improving IT capabilities to support conventional ammunition distribution**

For the remainder of the last morning the following presentations were given:

- Transportation Issues
- Military Occupational Specialty (MOS) Sponsor Issues



LtCol Dachman, Deputy PM-Ammo, briefs on Ammunition MOS issues

The Working Groups briefed out their findings as follows:

- Class V(W) Playbook Revision
 - ❑ Distribute when update is finished
- Lessons Learned from OIF/OEF
 - ❑ Solicit Lessons Learned via "Ammo Mail"
 - ❑ Short term: PM-Ammo will post Lessons Learned on Knowledge Management Portal (KMP)
 - ❑ Long Term: PM-Ammo will assist Marine Corps Systems Command in posting Lessons Learned on its Webpage
- PICP Review
 - ❑ Develop standardized reporting packages
 - ❑ Develop statistical random sampling inventory program
 - ❑ Provide standardized reporting tools or web-based reporting tools from individual ASPs
 - ❑ Develop a quality control process for management of Notices of Ammunition Reclassification (NARs) and receipts process
- Monthly Inventory Review Report

- ❑ Over the next 3 months the Corps' ASPs will be using the KMP for a test in their reporting procedures
- *MCBul 8010* Review
 - ❑ TECOM will produce a Draft Chapter 1 of the bulletin
 - ❑ Draft will be staffed to the ammunition community
 - ❑ TECOM to produce new Chapter 1 no later than 1 May
- *Marine Corps Order 3000.18, Force Deployment and Execution Manual* Review
 - ❑ PM-Ammo will incorporate recommended changes
 - ❑ EFDC will provide a statement of requirements and desired capabilities for asset and in transit visibility for munitions to MARCORSYSCOM



Mr. Jerry Mazza, PM-Ammo, addresses attendees

Mr. Mazza concluded the conference with closing remarks.

LtCol Crittenden is employed by CACI, Inc.



Manufacturing Artillery Fuzes

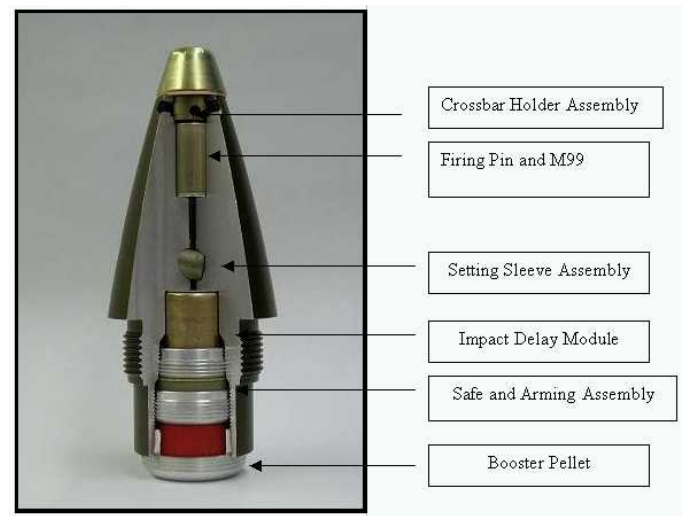
L-3 Communications / BT Fuze Products

The U.S. Military spends over \$200M annually to purchase fuzing for its bombs, rockets, gun-launched projectiles, and grenades. Fuzing represents perhaps the most complex, technically difficult ordnance products to design and produce. Why? First, fuzing is primarily designed to protect us. Fuzing is designed to ensure that the warhead to which it is attached must NOT go off until we want it to—every fuze must therefore have a “safe and arm” mechanism. Moreover, military specifications require that the safe and arm mechanism must sense two separate environments after launch; e.g., rotation, or setback, or a form of either an electrical or mechanical release. After sensing these two totally different environments, the fuze must now have a mechanism that allows “safe separation” from the launch platform—time equals distance—therefore a timing mechanism becomes the second design feature. Lastly comes the target (is it hard, soft, deep, or, just dispensed over the target air burst—or in proximity?). This targeting, or kill mechanism, represents the most complex element of most fuzes—the portion that houses the clock, radar, process algorithms, and proximity sensing componentry.

This article is about several types of fuzing used in artillery applications—an environment that adds the complexity of 30,000gs of destructive launch force and 20,000-plus revolutions/minute of spin. Two of the fuzes designed for this environment are the old workhorse point detonating fuze—the M739A1—used for training and HE barrage area targets. The second is the highly advanced and much acclaimed M762A1 and its variant M767A1 electric time fuzes employed on all U.S. military 155mm and 105mm cargo and air burst projectiles (Notably, the ET fuzes have an excellent point detonating capability included.) Both fuzes are produced by L-3 Corporation’s BT Fuze Products (formerly known as Bulova) in Lancaster, PA. BT Fuze has been a major producer of the U.S. ammunition industrial base since WW II, when the Government sought timing devices from the great clock and watch companies. BT Fuze is a merger of the old Bulova and Hamilton watch companies converted to defense products.

The M739A1 Story

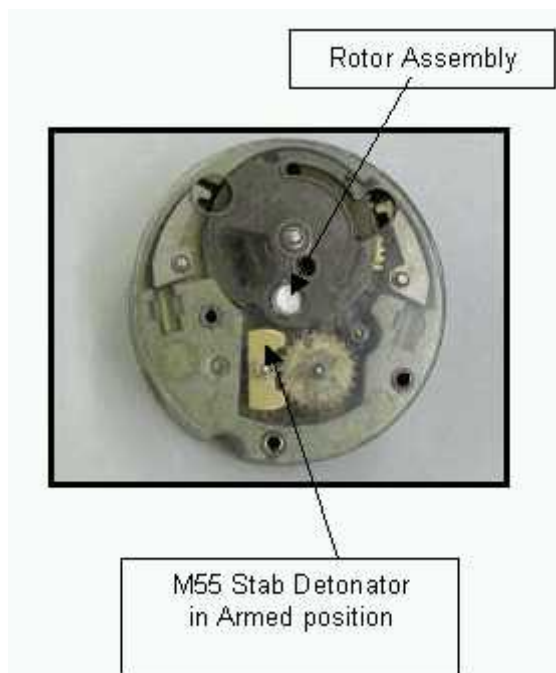
The M739A1 is the U.S. Government’s standard mechanical point detonating fuze for 105mm and 155mm howitzer projectiles, as well as 4.2” mortar rounds. The fuze is rugged, simple, and affordable. The fuze design is the baseline for the Air Force’s FMU-153, the Navy’s MK407, and the Army’s MK399 point detonating fuzes. It is sold around the world to our allies. The M739A1 Fuze consists of 66 unique components, such as energetics (explosive elements), zinc die castings, and machined components procured from 40 key suppliers. These components are integrated at BT Fuze into 13 subassemblies and finally the M739A1 Fuze. The fuze is a modular design that, along with the relatively high-production requirements experienced in the past, provided the opportunity for automation. These modular assemblies are identified in Photograph 1.



Photograph 1: Cutaway view of M739A1 Fuze

The fuze is manually set to either Point Detonating or Delay mode prior to launch by rotating the Setting Sleeve Assembly with a screwdriver or coin. Upon gun launch, the Safe and Arming Assembly (S&A) senses the setback acceleration and centrifugal forces, releasing the M55 Detonator to rotate to the armed position. On impact, the Firing Pin and M99 Detonator Assembly crush and initiate flashing down the tube and initiating the in-line M55 Detonator in the S&A. If set in the Delay mode the flash from the M99 is blocked and the Impact Delay Module (IDM) creates the delay function. The IDM senses deceleration after impact, which releases a spring-loaded firing pin into the in-line M55 Detonator in the S&A. The M55 Detonator initiates a

PA508 Lead explosive, which detonates the Booster Pellet. BT Fuze has the only M739A1 automatic assembly line in the world, approved by the U.S. Government. This line has produced over 2.3 million fuzes. The production line consists of a 10-station manual line for the Impact Delay Module (IDM) and 16 automatic assembly machines for the remaining sub-assemblies and final fuze assembly. The automated assembly equipment ranges in complexity from simple pin-pressing operations to complex dial index and walking beam machines. The number of components assembled vary with each machine, and they are equipped with presence and position sensors to ensure the components are in the proper location and orientation before further processing is accomplished. The machines perform a multitude of 100% inspections, arming and non-arming functional spin tests at a specified RPM and numerous critical (safety) checks.



Photograph 2: M739A1 Fuze S&A Assembly

The most complex M739A1 assembly to produce is the S&A. (See Photograph 2.) The S&A is a delay arming mechanism that activates upon launch with setback and spin forces and assures a critical safety function for the user. When fired, the setback pin moves rearward partially freeing the Rotor. Centrifugal force opens the two spin detents, which fully releases the Rotor. The unbalanced Rotor rotates and moves the M55 detonator in-line to allow the pyrotechnic function upon impact. The S&A Assembly is assembled on a series of 8

automated machines similar to the machine shown in Photograph 3. This machine, consisting of 3 large bowl-feeders, 3 small bowl-feeders, 30 fixtured nests, and 9 inspection probes, begins the S&A Assembly by assembling 2 subassemblies (Lower Plate and Shaft Assembly and Spacer Subassembly) with 4 other components (Rotor Lock Pin, Spring, Disk, and Bottom Plate), then off-loads the S&A Assembly into a magazine rail. This equipment can produce an average rate of 30,000 assemblies per month.



Photograph 3: M739A1 S&A Plate and Spacer Assembly Equipment



Photograph 4: M739A1 Arm and Non-Arm Spin Test Equipment

The automated equipment, in Photograph 4, conducts the critical arming and non-arming spin tests. This equipment performs an exercise spin at 5,000 RPM, an arming time spin at 1,700 RPM, verifies the Rotor is locked in the armed position, records the results, then performs the 1,100 RPM non-arming test. The equipment also rewinds the S&A to the safe position after each spin. Final fuze assembly is accomplished on four machines in the following order:

- Fuze Body & Setting Sleeve Assembly: The Setting Sleeve is assembled into the Fuze Body and spin tested for arm and non-arm function.
- Fuze Body & IDM Assembly: The IDM and a Disk are inserted into the cavity of the Fuze Body and held in place with the Closing Screw.
- Fuze Body & S & A Assembly: The S & A/Retainer Assembly is torqued into the Fuze Body and a Disk Seal and silastic sealant is applied.
- Point Detonating Assembly: A Seal Disk, the Firing Pin Housing and Detonator Assembly, silastic sealant, and the Crossbar and Holder Assembly are assembled into the nose of the Fuze Body and the Nose Cap is pressed on. The Fuze is then marked and is ready for packaging.

The fuzes are transported to an explosive facility for loading the booster pellet.

The utilization of automated equipment to assemble, inspect, and identify the critical characteristics assures and maintains a performance reliability rating over 99%. The repeatability and reliability of the automated operations lowers the probability to less than 1 in 1,000,000 chance of a critical defect invading the system.

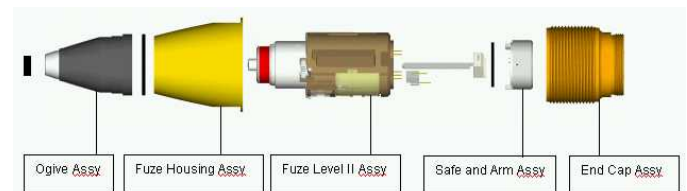
M762A1 Electronic Time Artillery Fuze

The M762A1 is a nose-mounted fuze that provides precision timed airburst for all fielded and developmental 105mm and 155mm cargo, smoke, and illumination artillery projectiles. (See Photographs 5 & 6.) The precision-timed airburst capability is accurately controlled by electronic circuitry that uses tuning fork crystals as the time base. An integrated circuit chip is used for logic and control operations, while the lithium thionyl chloride reserve cell battery serves as the power source. The fuze can be set manually, without the need of a hand tool, or automatically via a link with an inductive auto-setter that complies with NATO standards. The M762A1 has the capability to receive rapid inductive fuze settings, which in turn facilitate the rapid firings rates of the modern weapon systems. At

launch, the setback and spin environment forces the release of mechanical locks on the S&A device and also closes a spin switch in the Electronic Assembly that starts the timing sequences. If the fuze is set in time mode, the fuze arms mechanically at 50 milliseconds prior to the set function time.



Photograph 5: Cutaway view of M762A1 Fuze

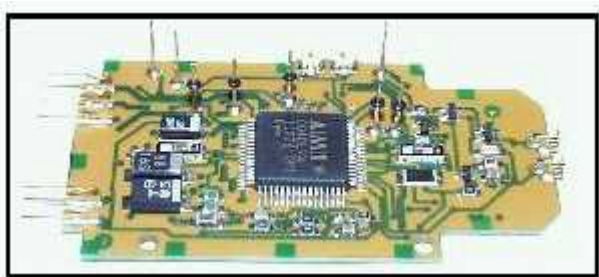


Photograph 6: Another view of M762A1 Fuze

If the fuze is set to the impact mode, mechanical arming occurs at 0.5 seconds after the spin switch senses the appropriate continuous spin. The fuze is armed when the electric detonator of the S&A Assembly is positioned inline with the lead explosive in the base of the fuze. In time mode, when the set time has elapsed, the fuze initiates the detonator, which causes the explosive train to initiate the projectile's explosive train. The M762A1 incorporates features to facilitate Explosive Ordnance Disposal (EOD). The purpose of the features is to deplete all the fuze energy sources in an unexploded armed projectile should the fuze fail to function. The manufacturing of this complex electro-mechanical device has been refined over the life of the fuze. The baseline M762 fuze was originally designed in 1984 and then modified in 1998 to improve the fuze reliability, robustness, and producibility. Over the 20 year life of

this fuze family, a combination of manual processes and automated assembly equipment have been developed and refined to manufacture and inspect this highly regarded fuze.

The M762A1 Fuze is a complex device. A total of 69 assembly operations and 82 inspections are performed to manufacture the fuze. The 135 components in the M762A1 Fuze are a combination of plastic molded components, metal stampings, springs, metal turnings, and electronic components. They are assembled into eight main assemblies: Ogive Assembly, Fuze Housing Assembly, Fuze Level II Assembly (Liquid Crystal Display Housing Assembly, Printed Wiring Board (PWB) Assembly, Power Supply Module Assembly), S&A Assembly, and End Cap Assembly.



Photograph 7: PWB of M762A1 Fuze

The first and perhaps most important assembly in the production of the M762A1 Fuze is the PWB shown in Photograph 7 above. The PWB is assembled on state of the art automated surface mount equipment as depicted in Photograph 8 and then inspected with an automated vision system for component placement and solder integrity (See Photograph 9.)



Photograph 8: PWB Assembly Equipment

The PWBs are then 100% functionally tested in automated temperature testing equipment. The equipment verifies the electronic circuitry of the fuze is



Photograph 9: PWB Inspection Equipment

operating properly at both the hot and cold temperature extremes of the fuze. The PWB Assembly is then mated to a plastic injection molded Power Supply Housing (See Photograph 10.) The Power Supply Housing contains a cavity around the PWB assembly components that is later filled with a flexible epoxy encapsulate.



Photograph 10: PWB Assembly mated to a plastic injection molded Power Supply Housing



Photograph 11: Inductive Coil Assembly and Grounding Clip soldered to the exposed side of PWB

The Inductive Coil Assembly and Grounding Clip are attached and then soldered to the exposed side of the PWB (See Photograph 11.) The LCD Housing Assembly, which contains the LCD display used during manual setting of the fuze and several other components, is assembled to the unit. Each unit is 100% Electrically Tested on automated equipment to verify the PWB, LCD Display, and the Coil Assembly are connected and functioning properly (See Photograph 12.) The EOD mechanism and power source are then attached into cavities on the outside diameter of the Power Supply Module.



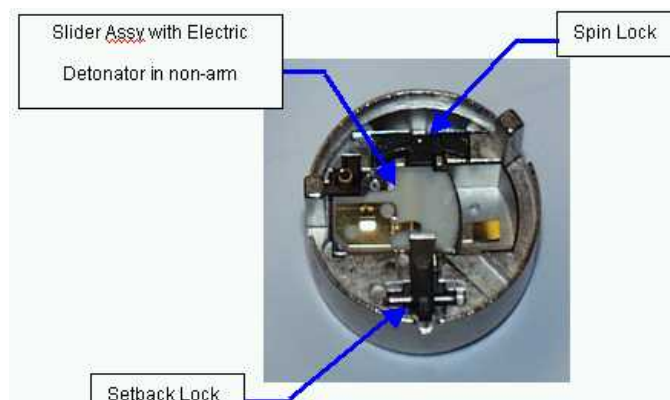
Photograph 12: 100% Electrical Testing of Unit

The unit is 100% electrically and mechanically (spin) tested to verify the unit functions properly at the arm and non-arm spin rates of the fuze. The unit is now ready to be assembled into the outer shell of the fuze. Another 100% Count Level Test is completed to verify the manual setting mechanism is functioning properly. The unit is inert; it contains no explosives up to this point of the assembly process. The units are transferred into a temperature and humidity controlled environment to condition the unit for sealing. In the controlled room, the Battery Primer Assembly, the explosive used for battery activation, and the Stab Assembly are loaded into the exposed end of the Level II Assembly in a special explosive containment workstation. The Safe and Arm Assembly is manually attached to the interface pins of the PWB Assembly as depicted in Photograph 13.

The S&A Assembly in Photograph 14 is a major assembly of the M762A1 Fuze. The S&A Assembly contains two of the four explosive components found in the M762A1 Fuze. The S&A Assembly is manually assembled and then 100% tested in a special explosive containment workstation. The S&A Assembly prevents unintentional fuze detonation during storage, transportation, and handling. The fuze is made safe through three independent mechanical locks in the S&A:



Photograph 13: Assembly of S&A Assembly



Photograph 14: M762A1/M767A1 S&A Assembly in Non-Arm Position

the setback lock, the spin lock, and the slider's integral shear pin. These mechanical locks hold the Slider Assembly in the safe position, i.e., the Electric Detonator is out of line with the Explosive Lead. Each S&A Assembly is tested in a spin fixture to verify the Electric Detonator is free to slide into the armed position under the spin environment of the fuze design (See Photograph 15.)

The fuze is ready to close after the S&A Assembly has been assembled to the unit. The End Cap Assembly is the component that supports the S&A Assembly and completes the outer shell of the M762A1 Fuze. The End Cap Assembly, which contains the Lead Explosive, is produced on an 8- position automated rotary assembly machine (See Photograph 16.) The aluminum impact End Cap is manually loaded onto a loading belt and the explosive Lead is introduced into the process via a vibratory bowl. The inspection, staking, and foil sealing



Photograph 15: S&A Assembly tested in a spin fixture



Photograph 16: Automated End Cap Assembly Equipment

are completed before the operator removes the completed assembly from the equipment. The completed End Cap Assembly is moved into the temperature and humidity controlled environment to condition the End Cap Assembly for sealing. An adhesive is applied to the threads of the End Cap Assembly prior to torquing it onto the fuze. Using the spanner wrench holes on the bottom of the End Cap and the flats on the Fuze Housing, the fuze is closed and torqued to the required value. When the adhesive has cured, the fuze is almost complete. The fuze identification and lot number are stamped into the zinc die cast Fuze Housing as depicted in Photograph 17. The fuze is now ready for the lot acceptance testing and packing into the Ammo Cans.

Conclusion

L-3 BT Fuze Products built 1.2 million baseline M762/M767 Fuzes for the U.S. Government during the 1990s. Over the last 5 years of M762A1/M767A1 Fuze production at L-3 BT Fuze Products, 46 consecutive lots totaling 1 million additional fuzes have been delivered to the U.S. Government without a production lot failure.



Photograph 17: Completed M762A1 Fuze in Marking Machine

The Ballistic Lot Acceptance Tests to date for the M762A1 Fuzes have proven highly successful, yielding an overall performance reliability of 99.7% and an overall setting reliability of 99.9%. In 2003 the M762A1/M767A1 Fuze was named as one of the U.S. Army's Greatest Inventions. The fuze's exceptional reliability, unmatched timing accuracy, user friendly features, auto settable capacity, and low cost design assures the M762A1/M767A1 as the long term fuzing solution for all fielded, developmental, and future 105mm and 155mm artillery weapon systems inclusive of the Lightweight 155mm Howitzer and the 155mm Paladin Howitzer.



PM-Ammo “Tells Its Story” to the Transition Task Force, DC I&L

Mr. Steven M. Crittenden, LtCol, USMC (Ret)

On 18 February 2005 the Inventory Management and Systems Division (IMSD) hosted an all-day Program Manager for Ammunition (PM-Ammo) overview given to the Transition Task Force (TTF) recently stood up by the Deputy Commandant for Installations and Logistics (DC I&L), LtGen Richard L. Kelly. The overview was provided with the intent to develop a partnership between PM-Ammo and the TTF on Logistics Modernization (LogMod) efforts embarked on by I&L.

In the August 2004 issue of the *Marine Corps Gazette* LtGen Kelly authored an article titled “Logistics Modernization: A Marine Corps Warfighting Imperative” in which he outlined LogMod concepts and initiatives of the Corps. To assist in implementing these concepts and initiatives, he established a TTF. As part of the “Logistics Family,” PM-Ammo recognized that I&L’s LogMod initiatives would have a significant influence on the ground ammunition community in the near future. Similarly, modernization initiatives within PM-Ammo could have a meaningful impact on I&L’s LogMod initiatives. With this in mind, IMSD set out to make sure the TTF was fully aware of PM-Ammo’s modernization programs. The end result was the 18 February briefings to the TTF. IMSD briefed the following PM-Ammo concepts and initiatives:

- MCCDC Ammunition Logistics Chain Efficiency and Policy Study
- Knowledge Management Enterprise (KME)
- Physical Inventory Control Program (PICP)
- Unit Level Ammunition Status (ULAS)
- Electronic Ammunition and Explosives Qualification and Certification Program (^EQual)
- Ordnance Information System (OIS)
- Ammunition Budget Management System (ABMS) Enhancements
- Common Logistics Command and Control System (CLC²S)

Additionally, IMSD briefed the TTF on its ongoing involvement and collaboration in the following external initiatives:

- Common Logistics Command and Control System (CLC²S)
- USTRANSCOM as the Distribution Process Owner (DPO)

MCCDC Study. The MCCDC Ammunition Logistics Chain Efficiency and Policy Study, conducted by the Studies and Analysis Division at the request of PM-Ammo, examined post-production ammunition policies, functions, supply processes, reporting, and logistics chain employed during peacetime and combat operations with regard to establishing metrics for better business practices. The results of the study have been provided to PM-Ammo for assessment.

KME. PM Ammo’s Knowledge Management Enterprise (KME) is the collective repository of stored knowledge about ammunition in general, to include inventory posture, acquisition initiatives, and acquisition priorities. The KME’s core component is the Knowledge Management Portal (KMP). The KMP is a central repository of ammunition data located off of PM-Ammo’s web site that can be accessed by authorized users to facilitate decision making based on daily inventory updates by Department of Defense Identification Code (DoDIC), National Stock Number (NSN), location, and condition code. It also provides information regarding the Corps’ total munitions requirement for each item. The KME, using the KMP and other resources, makes centrally maintained data available in a one-stop data mart. The KME also includes a broad range of tools (like the Ammunition Budget Management System (ABMS), and the soon-to-be-fielded Electronic Ammunition & Explosives Qualification & Certification tool (^EQual).



DC I&L TTF members listen to PM-Ammo briefers

These tools support various elements of the ammunition program for PM-Ammo and the Operating Forces, and provide users with access to a wide range of technical data for the ammunition items in the Corps' active inventory, as well as munitions to be fielded with future weapon systems.

PICP. The PICP is a programmatic approach to achieving and maintaining the highest possible level of inventory accuracy. Utilizing the PICP gives the Officer-in-Charge of an Ammunition Supply Point (ASP) a set of tools with which his/her staff can quickly and routinely evaluate the inventory stockpile in comparison to the inventory records. The data gathered during this stockpile evaluation can then be analyzed to help identify trends and determine the effectiveness of the processes and procedures in use at the ASP. Components of a PICP are: conduct and reconciliation of physical count of the stockpile utilizing a random sampling approach, a survey of all storage locations, a quality control program, discrepancy research and reconciliation, and management reporting. The ultimate goal of the PICP is to ensure the storage and accounting functions support the highest level of inventory accuracy possible on a daily basis.

ULAS. ULAS is an automated tool designed for the supported units (trigger pullers) that assists them in collecting, reporting, analyzing, and preparing ammunition status reports utilizing a hand-held device. ULAS has been field tested via a Proof of Concept funded by the DoN's eBusiness Operations Office (culminating with 11th Marine Artillery Regiment making the first combat expenditure report 2 hours after entering Iraq during OIF I—that report was globally available within 30 minutes through the ULAS website). ULAS collects and securely reports sufficient data for the Marine Component Commander to accurately produce the DoD-mandated Munitions Status Report, or MUREP, that is required by the Unified Combatant Commander in combat theaters. ULAS's primary role is to provide near real-time asset visibility of ammunition that has been issued to the Operating Forces from ammunition supply activities. Ammunition data is received, processed, and aggregated at a single location, then becomes globally accessible to the user community through a web browser—without impacting tactical communications.

^EQual. *EQual* will allow authorized users to perform all aspects of the administrative process of tracking Explosives Qualifications and Certifications of all designated personnel—thus eliminating the current manual record keeping process. It will support the

automated administrative and management process requirements for documenting, storing, and centrally managing ammunition and explosives qualifications and/or certifications required by DoN and the Marine Corps. ^E*Qual* is a tool that supports: (1) A web-enabled front end that supports the standardized collection, reporting, and retrieval of information, and (2) A database back end that organizes, maintains, and stores data (data model) within the ^E*Qual* database. Initial pilot evaluation of *EQual* will commence in April 2005.

OIS. OIS is an integration of ordnance logistics systems used by the Navy and Marine Corps for ordnance asset management and accountability. It is comprised of integrated applications and distributed databases providing controlled global access wherein a single action results in system-wide update. Once in place, OIS will be deployed on a multi-level security infrastructure—thus allowing the integration of existing unclassified systems on the unclassified network and classified systems on the classified network. OIS will ultimately replace 24 legacy ordnance management and ordnance information systems currently in use by the Navy and Marine Corps at both the retail and wholesale levels.

ABMS Enhancements. ABMS enhancements over the older, client-server architecture that was limited in scope include a web-based environment that is integrated within PM-Ammo's KMP. The enhancements include:

1. Reducing the labor-intensive demands of the Budget Management Cycle
2. Standardizing reporting
3. Providing a step-based approach to budget development and generation
4. Allowing for multiple budget book creation options
5. Allowing for electronic portability of created budget exhibits
6. Providing master page numbering control for partial generations

CLC²S. CLC²S, an initiative of the Deputy Commandant for Installations and Logistics, is a tactical, web-enabled logistics information management system designed to provide the Marine Air-Ground Task Force (MAGTF) with enhanced capabilities to assess, plan, and execute logistics functions to achieve mission objectives in a training and operational environment. Through speed of information and exploitation of technologies, CLC²S can provide near real-time asset visibility, asset management capabilities, decision support tools, and integrated request management in a distributed, rapidly changing battlefield environment.

CLC²S has three support modules that pertain directly to ground ammunition: Logistics Planning and Execution, Enhanced Combat Service Support Operations Center/Combat Operations Center System (ECS), and Rapid Request Tracking System. The ECS will be the data entry point for data feeds from ammunition inventory reporting systems such as OIS and ULAS.

TAMIS-R. TAMIS-R is a web-enabled application for the management of training ammunition. It was developed by the Army but is currently in use by the Army and the Marine Corps. Replacing a pantheon of locally developed legacy tools, it allows for real-time data sharing and interface, while providing visibility of authorizations, forecasts, and expenditures to all levels in a unit's chain of command. TAMIS-R provides the ability to reallocate ammunition allowances between units, forecast a unit's training ammunition requirements to the ammunition supply point (ASP) and, through the use of the recently deployed electronic Training Ammunition Request (TAR) module (to replace the Transportation Request (TR) module) that goes directly to the ASP, reduces the need for manual processing of requests up through the chain of command.

DPO. In September 2003 the Secretary of Defense (SECDEF) identified the Commander, U.S. Transportation Command (USTRANSCOM) as the Distribution Process Owner (DPO) for DoD. The SECDEF charged TRANSCOM, as the DPO, with transforming and improving the overall efficiency and interoperability of distribution related activities "from factory to foxhole." The DPO initiated the End-to-End Architecture aimed at synchronizing the distribution requirements and capabilities of the Services and supported Combatant Commanders in the planning, acquisition, storage, and delivery of sustainment materiel in both peace and war. From November 2004 to January 2005 members of PM-Ammo represented the Marine Corps as subject matter experts on a Capabilities-Based Analysis Team (CBAT) at USTRANSCOM to help the DPO develop a business case analysis identifying the optimal mix of information technology systems, tools, and procedures to support joint munitions distribution management. The CBAT determined that architecture improvements should focus on:

- Visibility—you can only optimize what you can see
- Collaboration—each Service capable of operating in its own, but not a shared environment
- Automation—key data objects need to flow from planning to execution without re-entry

In conclusion, DC, I&L's TTF learned a great deal about the many modernization initiatives ongoing in PM-Ammo. In fact, several TTF members expressed an interest in some of the systems being developed, especially ^EQual. The bottom line is that the TTF is now "armed" with information about those modernization initiatives, and will be able to make more informed decisions when they consider ground ammunition in their own modernization plans.

See bio, page 6.

TAMIS-R Update

As announced in CG MARCORSYSCOM message DTG 011915Z MAR 2005, the Marine Corps transitioned to the Training Ammunition Request (TAR) on 1 April 2005. This transition provided enhancements to the requisition process. Training presentations for the setup and use of the TAR for both supported units and supporting units (ASPs) are available on the PM-Ammo website at www.marcorsyscom.usmc.mil/am/ammunition/ (click "TAMIS-R" in navigation column, left side). Users should download these presentations from the site in order to read critically written instructions provided in the speaker notes of the presentation.

Currently some users are experiencing difficulties with the Country, Location, Installation/Area, and Training Area fields while creating a TAR. The Country field is a required field and must be completed. The remaining fields are not required to submit the TAR and the drop down fields do not currently reflect information for all training sites.

The e-mail address assigned to the ASP Unit POC within TAMIS-R will receive an e-mail that a TAR is ready for acceptance. While this e-mail provides important data for the ammunition requisition, this does not complete the requisition process. To formally receive the requisition, the ASP must select the "ASP Accept TAR" option in TAMIS-R. This allows an ASP to accept a TAR after reviewing it. Acceptance means that the ASP is acknowledging receipt of the TAR at the ASP—not fulfillment of the unit's ammunition request. This step must be accomplished in a timely manner to complete the requisition process. PM-Ammo has established a Help resource for all TAMIS-R problems. The address is tamis@mcsc.usmc.mil. All requests for help must be sent to this email address.

Manufacturing Projectile Metal Parts Assemblies for Artillery and Mortar Rounds

Chamberlain Manufacturing Corporation

Chamberlain Manufacturing Corporation has operated the Scranton Army Ammunition Plant and manufactured projectile metal parts assemblies for artillery and mortar rounds for over 41 years. Over 22 million parts have been shipped from this location to all Departments of the United States Armed Forces. Marine Corps products include the M795 and M107 High-Explosive Projectile Bodies and the M110A2 Smoke Projectile Body. The forging process that begets these bodies is specific and unique, and is executed by state of the computer controls and robotics.

The process begins with the Technical Data Package (TDP), containing drawings and specifications for the ammunition being procured, supplied by the Procuring Contracting Officer (PCO) during the solicitation phase. Chamberlain engineers review the TDP to determine what the purpose of the round is. Is it Cargo, High Explosive, Illuminating, or Smoke? Its purpose determines the process steps required to manufacture it. Other considerations include such ballistic characteristics as range and lethality.

The majority of high-explosive and smoke rounds are forged bottom or base-end down which allows the open end to be machined, hot-nosed closed, heat-treated, finish machined, and coated. The explosive is then hot cast into the projectile body through the fuze hole in the nose.

The majority of cargo or illuminating rounds are forged nose end or ogive down since the inside cavity is going to be finish machined after heat treat to allow the submunitions or the canister containing the illuminating candle assemblies to be installed. These types of rounds generally have a base plug of some type that is either pressed into the open end of the body or is pinned to it.

In either case, the forgings required to produce these munitions are made by a hot-forging process identified as either backward extrusion or piercing. This process

produces hollow cylinders from solid pieces of bar stock called mults. A mult is a piece of a bar that has been cut to the weight required to net the forging as designed by the engineer. The cross section of the mult can either be round or square depending on the way the engineer processes it. The mult is then heated to a forging temperature of approximately 2,100 degrees F, based on the particular alloy of the steel specified by the metallurgist or in the TDP, in either a gas-fired rotary hearth furnace or an electric induction heater to bring the material to a plastic state where it can be formed without damaging it or creating defects that would hinder the performance of the round. The heated mult is then transferred to the forging press system for processing where the mult is placed into a female die and a punch is pressed into the mult by the ram of the press causing the material to flow upward along the inside diameter of the die and the outside diameter of the punch. While the ram moves downward, the wall of the cylinder moves upward between the punch and the die.



M107 High-Explosive Projectile Mult

All of the tooling involved in the forging process is designed by our engineers and is manufactured by our machine shop. Temperature considerations have to be included in the component tooling drawings to ensure that the end product cavity meets the required TDP dimensions after it has cooled from forging to room temperature. This is verified using specially designed hard gaging in both the hot and cold parts to ensure that the product meets the exacting tolerances on the component part drawings. The parts are further processed through Chamberlain's production shop and shipped to the respective load plant.

The driving ambition of all employees at Chamberlain Manufacturing Corporation is focused to accomplish one goal: Supply the members of our Armed Forces with the most accurate, dependable, and reliable munitions systems in the world. It is an honor to serve our American heroes in the United States Marine Corps.

The Mythical Pot of Free Ammo

Ammunition Section, G-4, III MEF

Unfortunately, as with most myths, this one is not true either. Marine Corps Systems Command's (MARCORSYSCOM's) Program Manager for Ammunition (PM-Ammo) procures all ammunition for use in combat or training. MARCORSYSCOM's PM-Ammo is responsible for the life-cycle management of Class V(W). This article provides an overview into what is required to submit a special allowance request and/or a change to Marine Corps Bulletin (MCBul) 8011.

Units requiring additional ammunition for training must submit a Special Allowance Request or a recommended change to MCBul 8011, "Class V(W) Materiel Allowance For Training and Security." Examples are contained in the MCBul 8011. The following information provides insight into how the process works.

- Funding to support special allowances does not exist. Ammunition procurement is based on known requirements, therefore, special allowances that exceed the training requirement draw directly on the out years without funding for replacement. Further, since training requirements are not decremented to offset the special allowance expenditures, inventories of war reserve materiel requirements are also affected.
- Special allowances are intended to provide commanders with additional ammunition to conduct training beyond the prescribed annual ammunition allowance. In most instances, requests for special allowances can be supported from within the unit's chain of command or the Supporting Establishment through redistribution of assets. Commanders at all levels are encouraged to scrutinize every request for increases to annual allowances and to exhaust all means prior to seeking a special allowance. Favorable consideration will be given to special allowance requests once the unit's expenditure for the requested ammo has reached 80% expenditure for that DoDIC. To preclude the submission of unnecessary requests, commanders at all levels should analyze historical expenditure

patterns and redistribute ammunition among commands.

- When all other options have been exhausted, requests for special allowances should be submitted via naval message. Special allowances may be authorized for those items that exceed the total munitions requirement and are eligible for stratification.
- Requests for special allowances must be submitted to the Commanding General, Training and Education Command (CG, TECOM) Quantico, VA (Attn: C 462AMMO) via the appropriate chain of command. Info copies of special allowance requests should be provided to Commander, MARCORSYSCOM, Quantico, VA (Attn: AM-IM). Format for special allowance requests can be found in Appendix C of MCBul 8011.

CG TECOM will act as the approving authority for all special allowance requests based on the supportability analysis provided by MARCORSYSCOM's PM-Ammo.

The following exempt categories have been defined to distinguish them from special allowances, and may be supported as funded out-of-cycle increases to the training requirement:

1. Approved establishment of new units.
2. Approved changes to Plans of Instruction.
3. Approved changes to Course Descriptive Data.

KMP Update

Public Key Infrastructure (PKI) is coming to KMP. Look for more news about this on the PM-Ammo Public Web Site and the "New Items" Section on the KMP.

Prior to submission of special allowance requests, you should determine if the request has been validated by the G-3/S-3 and if it is based on a training standard. Bottom line—how did the unit come up with these numbers?

With increasing unit cost, diminished funding, and increasing total Class V(W) requirements, ammunition must be controlled, managed, and used effectively and efficiently. It is incumbent on commanders at all levels

to responsibly manage those training ammunition resources allocated to meet their training requirements.

The basic Class V(W) allowances are contained in MCBul 8011 for sustainment training, and are based, in part, on Individual Training Standards (ITS), Mission Performance Standards (MPS), and those directives listed in Appendix D—as well as currently identified tables of organization (T/Os) and tables of equipment (T/Es). ITSs and Training and Readiness manuals alone are not justification for increased training allowances. They represent the ammunition resources required to validate those tasks, core skills, and commanders' Mission Essential Task Lists (METLs).

There currently are no standards for Marine Corps Common Skills (MCCS) training. TECOM G-4 Ammo has fought to maintain these allowances until they can be reestablished.

Units without a T/E allowance for a weapon identified in the MCCS section of MCBul 8011 are not required to train to those tasks. Therefore, ammunition allowances are authorized for T/E weapons only. Ammunition is provided for only one (1) team per crew-served weapon listed on the unit T/E if it is manned by non-MOS Marines.

Simulation should be an integral part of training development, and it is ideally suited to the conduct of MCCS sustainment training. Where simulators are available, and standards have been updated to incorporate simulation, the use of simulators is directed. In the event that you are training Marines unfamiliar with the weapons, it is highly recommended that you use simulation training prior to doing live fire.

In those cases where additional ammo is required on a reoccurring basis, a change to MCBul 8011 is required. For the submission of changes to the MCBul 8011, it is recommended that your S-3/G-3 validate the requirement(s) for ammunition contained in your request in accordance with the information provided in MCBul 8011 before the request is sent.

The format for the special allowance/change is contained in Appendix B of the bulletin. You must provide a justification for the special allowance/change. It is recommended that changes be submitted via naval message. Recommended changes require a statement that all like units have discussed and concur with the recommended change.

Keep in mind that FAM firing is not a justification for additional ammunition nor is it a training standard.

Based on guidance from Marine Forces Pacific (MARFORPAC), below are the procedures for requesting Class V(W) training assets for units deployed in support of OIF and OEF:

- Using units are required to determine Class V(W) training ammunition requirements via their chain of command to MARFORPAC/MARCENT. This requirement should be determined prior to deployment if possible.
- The request should be submitted in a timely manner to allow for sourcing and support and shipment times required for the area of responsibility (AOR).
- All ammunition expended while conducting training will be supported with the unit's training allowance as found in TAMIS-R—regardless of the location of where the training will be conducted. Training expenditures will be reported in accordance with established procedures via the chain of command or TAMIS-R.

It is especially important to report expenditures when utilizing training ammunition issued from common item support (ammo received from the Army or other Services), or from any ASP other than Marine Corps ASPs. This is necessary to provide accurate records of the ammunition to be reimbursed by MARCORSYS-COM.

Any shortfalls should be handled using the redistribution process internal to the unit's parent command or as a special allowance in accordance with MCBul 8011.



Marine Corps Ground Ammunition School

FY 2005 MANAGERS COURSE DATES



Class 002-05 @ Redstone Report Date 1 June 05, Grad Date 30 June 05. The Ammunition Managers course includes the Explosive Safety for Navy Facility Planning Course (Ammo 36).

Class 003-05 @ Redstone Report Date 21 Aug 05, Grad Date 23 Sep 05. The Ammunition Managers course includes the Explosive Safety for Navy Facility Planning Course (Ammo 36).



Marine Corps Ground Ammunition School

FY 2005 NCO MTT DATES



Class 004-05 @ CPCA Convene Date 12 Jul 05, Grad Date 9 Aug 05. 25 school seats available for this class. The NCO MTT course includes the Naval Motor Vehicle and Railcar Inspection Course (Ammo 51).

Marine Element Points Of Contact

OIC - (256) 876-8441 DSN 746

SNCOIC - (256) 876-8441 DSN 746

Senior Instructor (256) 842-2604 DSN 788

Instructors:

(256) 876-1749 DSN 746

(256) 842-2535 DSN 788

(256) 842-2540 DSN 788

(256) 876-4400 DSN 746

(256) 876-1691 DSN 746

PM-Ammo Contact Roster

Billet Tel # (Comm: 703/DSN: 378)

PM	432-3159
DPM	432-3164
Off Mgr	432-3165
Hd, AP&BD	432-3107
Inf Wpns Tm	432-3147
LCAT	432-3114
Str Ammo Bus Tm	432-3107
Hd, IM&SD	432-3129
Inv Mgt Tm	432-3119
Analysis&Eval Tm	432-3158
Sys Tm	432-3117
MCPDSysRep	540-720-9400
Hd, ProdSptDiv	432-3168
EES Tm	432-3157
Plans&Exec	432-3141
Ops	432-3167

Liaisons (DSN)

DDESB	328-0449
NAVMAG Pearl Harbor	(C) 808-471-1111 X141
NWS Charleston	794-4378/4004
NWS Earle	449-2537/2539
NWS Fallbrook	873-3645
NWS Yorktown	953-7583
NSWC Crane	482-5427
NOSSA Indian Head	354-4965
FltAct Sasebo	315-252-5530
FltAct Yokosuka	315-243-1909/8
JMC Rock Island	793-4808/5549
AAA Crane	482-1552
AAP McAlester	956-6312
AD Tooele	790-2062
PEO Ammunition	(C) 973-724-2047

“Ammunition Quarterly”

The Ammunition Quarterly (AQ) provides a network and communications medium for the Marine Corps Ammunition Community to share information. It is your newsletter and your comments, suggestions, or questions are welcome. As always this is the Ammunition Community's Newsletter and is intended to provide new and experienced Ammunition personnel with pertinent information. Produced quarterly, the AQ is posted to the Program Manager for Ammunition Web Page, The Knowledge Management Portal, and distributed by hard copy to select organizations lacking full IT capability. As well, our AQ is distributed widely throughout the Corps to include most General Officers.

The editorial staff invites authors to submit articles dealing with topics drawn from several areas pertaining to Ammunition. Articles may be on a wide array of issues and topics, including processes, analysis, evaluation, activity, success stories, research, and ammunition safety. Have you found a way to do something smarter, faster, or improve your activity? If so, the AQ is a forum in which you can share your successes with your counterparts throughout the Marine Corps. Ultimately, these shared ideas will improve our ability to rapidly get steel on the target!

Make a commitment today and write an article to enhance the knowledge of the “Ammunition Community.” Challenge your Marines and Civilian counterparts to put pen to paper and be proactive within their community. **And don't forget, every author published will receive a handsome Ammo Quarterly Coffee Mug!**

Provide ideas/articles for Ammo Quarterly to the Program Manager for Ammunition, MARCORSYSCOM, 2200 Lester Street, Quantico, VA 22134-5010, or contact the Managing Editor at scriftenden@caci.com